
African rain forest dynamics: interactions between ecological processes and conservation actions

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Abstract

Documenting species distributions is of fundamental importance for better understanding vegetation responses to ongoing global changes. The sub-Saharan Africa flora contains high levels of species diversity but is undergoing negative shifts in response to ongoing climate changes and increasing anthropogenic pressure. Our goal was to synthesize available distribution data of vascular plants across sub-Saharan Africa to (1) provide insights into phytogeographical delimitation of Afrotropical vegetation and (2) to provide a regional conservation assessment of species in sub-Saharan Africa.

We compiled 13 unique datasets of vascular plant species distributions into a single meta-database called RAINBIO. In-depth quality checks and taxonomic expertise were applied to ensure a high quality dataset. For aim 1, analyses were based on floristic and phylogenetic similarities. For Aim 2, we developed an R package (ConR) to perform automatic and rapid preliminary assessments of conservation status following IUCN criteria A and B.

RAINBIO contains over 600000 unique georeferenced occurrences representing 24,000 plant species. We provide up-to-date phytogeographical delimitations of the Afrotropical region. While delimitations based on floristic similarity reflect biogeographical influences delimitations based on phylogenetic similarity reflect ecological influences. Fast-track evaluation of conservation assessments enables the preparation of a preliminary list of threatened species for countries and the identification of areas with high concentrations of threatened species. RAINBIO provides a unique view into the diversity of sub Saharan flora with implications in the phytogeographical delimitation of the region and a predicted 50% of all plant species potentially threatened with extinction.

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